

SALTON SEA UNIT 6

CURE DATA REQUESTS SET FOUR (# 276 - 358)

AIR QUALITY

276. The applicant estimated construction fugitive dust emissions using an emission factor of 0.011 tons of PM10 per acre-month, based on a 1996 MRI Report. The original calculations in Table G-1 applied the 0.011 ton/acre-month general construction emission factor to 100% of the disturbed area, or up to 224.4 acres. CURE Data Requests 1 and 2 pointed out that the applicant had misused this emission factor by excluding certain additional emissions. The procedure that the applicant used in the AFC, which is based on the 1996 MRI Report, uses on 0.011 ton/acre-month for “general construction” *plus* additional emissions of 0.059 ton/1,000 yd³ for on-site cut/fill *plus* 0.22 ton/1,000 yd³ for off-site cut/fill. The 0.011 ton/acre-month emission factor for “general construction” includes emissions from both on-site and off-site sources for everything but earth moving. (See MRI 1996, pp. ES-3, 4-3 to 4-4.)
- a. The applicant responded with a revised calculation of construction fugitive dust emissions, which again misapplies the MRI procedure. The revised calculations provided in response to CURE Data Request 1 only apply the 0.011 ton/acre-month emission factor to the 80-acre plant site, omitting the laydown area, park area, access road, well pads, well pad access, pipeline route, and transmission line route. Thus, the “general construction” emissions currently in the AFC in Table G-1 are correct and should not be revised by reducing the area used to calculate them. Please state whether the applicant agrees that the 0.011 ton/acre-month emission factor for “general construction” includes emissions from both on-site and off-site sources for everything but earth moving and thus, the general construction emissions in Table G-1 of the AFC are correct. If the applicant does not agree with this position, please explain why not, citing specific pages of the 1996 MRI Report to support your answer.
 - b. The MRI procedure that the applicant relied on requires that cut and fill emissions from on-site and off-site sources be added to the general construction emissions estimated

in Data Request 276a. (MRI 1996, Table 7.) The on-site cut and fill emissions are calculated from 0.059 ton/1,000 yd³ of “on-site cut/fill.” (MRI 1996, Table 7.) The response to CURE Data Request 1 calculates on-site cut and fill emissions using only 105,000 yd³. However, the AFC, p. 5.3-8 and attachment CDR-2 both indicate that this is only the total cut for the project site. The cut and fill emission factor is based on the sum of cut and fill, not just cut. The total fill is 167,000 yd³. Thus, the on-site cut and fill emissions should have been based on 272,000 yd³. Please correct this error, or explain why you believe only cut need be used, citing specific pages of the 1996 MRI Report to support your answer.

- c. The cut and fill emissions from off-site sources are based on 0.22 ton/1,000 yd³ “of off-site cut/fill.” (MRI 1996, Table 7.) The Response to CURE Data Request 1 calculates off-site cut and fill emissions using 62,000 yd³, citing Section 5.3.2.1.1 of the AFC. However, we were unable to locate this figure anywhere in the AFC. CURE Data Request 2 requested support for the volumes of cut and fill assumed in the revised fugitive dust emissions. Thus, please provide support for the 62,000 yd³ of off-site cut and fill, comparable to that provided in attachment CDR2 for on-site cut and fill.
- d. The support for the cut and fill calculations in attachment CDR-2, provided in response to CURE Data Request 2, cites information not in the record that is critical for following and understanding the provided calculations. Thus, please provide references 3 and 4 cited in CDR-2, page 4 of 4.

277. The Project site will be enclosed by an 8-foot high perimeter berm for flood control. According to the Geotechnical Report in Appendix J of the AFC, the north and west portions of the berm already exist. The cut and fill calculations in attachment CDR-2 indicate that the existing north road and dike will be replaced completely. The new volume of this road and dike is included in the fill calculations. However, there is no corresponding cut volume for removal of the existing road and berm. Further, the AFC did not reveal that the

north berm would be removed in its entirety. Please respond to the following questions on this issue:

- a. Will the existing north berm be removed and replaced by a new berm? If your answer is yes, please revise the cut and fill calculations in CDR-2 to include removal of the existing berm. If your answer is no, please explain the significance of the fill calculations on page 2 of attachment CDR-2.
 - b. What assumptions were made in the construction emission calculations and cut and fill calculations about repairs to the existing west portion of the berm?
 - c. Historically, filter cake was used to construct roads and berms in the area. If the response to subpart (a) is yes, please provide chemical composition data for the existing north berm that would be removed. This data is required to prevent construction worker exposure to potentially contaminated soils and to assure that the soils are properly disposed.
 - d. Please provide a construction schedule and equipment usage schedule for construction of the berms.
278. CURE Data Request 4 asked for support for the assumed 80% control efficiency used to calculate fugitive dust emissions and specifically requested a fully documented engineering calculation that identifies all assumptions. The response does not provide an engineering calculation, but instead cites a 2001 Muleski and Cowherd report, which is alleged to support the 80% control efficiency. We have reviewed this report, and it does not appear to support the assumed control efficiency. First, the tests were conducted in Missouri, which has much lower temperatures than the Project site. The higher the temperature, the higher the evaporation rate and the more water required to reach a given control efficiency. The Muleski and Cowherd report does not address this issue. The highest temperature that was considered was 80 F, which is much lower than typical construction season temperatures in the area. Second, the report only addresses scraper transit, which accounts for only a small portion of fugitive dust emissions, but not the more substantial cutting and filling

operations on either end of the transit. Thus, even if the report supported an 80% control efficiency, it would only apply to scraper movement and not other sources of fugitive dust. Finally, the report demonstrates that control efficiency declines sharply with time from water application. The response claims the report supports a 4-hour application frequency, but the data in the report only covers 2 hours. The relationship between control efficiency and time after watering is nonlinear. Thus, the data in the report cannot be readily extrapolated to the 4 hour frequency claimed in the data response. Further, using the 1988 MRI equation, 0.14 gal/yd² yields 0% control and 1.1 gal/yd² yields 72% control. Therefore, please provide the following additional information to support an overall 80% control efficiency:

- a. Response to CURE Data Request 4 states: “According to the test results [Muleski and Cowherd 2001], to achieve an average control efficiency of 80% from watering it would be necessary to dispense anywhere between 0.14 and 1.01 gal/yd² of water every 4 hours on exposed soil locations at the site.” Please support this statement with an engineering calculation, using the results from Muleski and Cowherd 2001. Your calculation should identify with specificity all figures, tables, or other information from Muleski and Cowherd that you rely on and identify all assumptions.
- b. Response to CURE Data Request 1 states: “An 80% control efficiency is being applied to the emission factors due to the mitigation measures that will be enforced on the Applicant during the construction period.” Please support this statement with an engineering calculation, using the results from Muleski and Cowherd 2001. Your calculation should identify with specificity all figures, tables, or other information from Muleski and Cowherd that you rely on and identify all assumptions.
- c. Response to CURE Data Request 4 states that water application could range from 59,249 to 427,440 gallons during peak usage, assuming a water rate of 0.14 to 1.01 gal/yd². This corresponds to 423,207 yd² (e.g., 59,249 gal/0.14 gal/yd² = 423,207 yd²). Please provide an

- engineering calculation that shows how the 423,207 yd² was estimated and which disturbed areas are included.
- d. Response to CURE Data Request 4 claims that tire cleaning controls 90% of the mud/dirt track out emissions. Please provide all information that supports this 90% control efficiency.
 - e. Response to CURE Data Request 4 states that the peak usage period for dust control water would be during the cut of the entire site (where cut appears to refer to both cut and fill). Please identify the beginning and ending months for this peak period and the length of time in days that it would last.
 - f. Response to CURE Data Request 4 states: “The 80% control efficiency is a combination of all mitigation measures listed in Section 5.1.4 of the AFC...” Please explain how the overall 80% control efficiency was determined. Your answer should identify each mitigation measure, the amount of PM10 due to the controlled and uncontrolled emission, and the control efficiency for each mitigation measure. Your response should address wind erosion emissions, which occur 24-hours per day, while watering only occurs during work hours.
 - g. Response to CURE Data Request 4 averages the range of peak water usage, 59,249 to 427,440 gallons, over the 20 month construction period and concludes the peak water usage would be 148 to 1,069 gallons per day. However, water is used throughout the 20-month construction period, not just during the peak period. Please estimate water use for non-peak periods and use them to estimate the annual average water use over the entire 20-month construction period.
279. The background statement for CURE Data Requests 6 to 9 noted that drill rig emissions were based on Caterpillar 3213DITTA emission factors that could only be met by new engines. CURE Data Request 7 asked whether the applicant would be willing to use drill rigs equipped with these engines. The applicant responded no, but clarified in the January 9, 2003 workshop that it may be willing

to commit to using low-emission engines if the data request were not tied to a specific engine type.

- a. Thus, would the applicant be willing to accept a COC that required the use of drill rig engines and fuel that meet the following emission factors that were used in Table G-2 to estimate drill rig emissions: NO_x, 6.55 g/bhp-hr; CO 0.8 g/bhp-hr; VOC 0.09 g/bhp-hr; SO_x 0.184 g/bhp-hr; and PM₁₀ 0.27 g/bhp-hr?
- b. If the answer to subpart (a) is yes, would the applicant be willing to verify compliance with the condition in subpart (a) by source testing each drill rig used at the site? If the answer to subpart (b) is no, please explain how the applicant proposes to verify compliance with this condition.
- c. If the answer to subpart (a) is no, please (i) provide all justification for your answer and (ii) revise the emission calculations in Table G-2 and the dispersion modeling in Tables 5.1-38 to 5.1-84 to use the emission factors in U.S. EPA AP-42, Table 3.4-1, which is the general reference for estimating emissions when there is no commitment to a specific engine type and accompanying vendor data.
- d. The response to CURE Data Request 9 states that the emission factors used to derive well drilling emissions “are based upon manufacturer’s data sheets and confirmed with actual stack emission tests of equipment that is routinely used for drilling in Imperial County.” Please provide copies of all manufacturer’s data and stack tests cited in your response that confirm the emission factors that were used.
- e. The applicant relied on information from drill rig contractors to characterize the rigs for modeling. Are the rigs used by these drilling contractors comparable to those that would be used to drill the Project’s production and injection wells? If your answer is no, please identify all differences and explain their impact on emissions and modeling assumptions.

280. The drill rig modeling assumed that rig engines would have a stack height of 14 feet, a stack diameter of 8 inches, a stack velocity of 114 ft/sec, and a gas flow rate of 2,340 acfm. CURE Data Request 10 sought all information that supported these assumptions. The applicant responded that the stack diameter and fuel use rate were provided by a licensed well drilling contractor and the exhaust flow rate was based on a fire pump engine data sheet that was provided in attachment CDR 10. Our follow-up questions on this issue are:

- a. Please identify the drill rig contractor that provided the information cited in your responses to CURE Data Requests 10, 11, and 16 and provide contact information (name, phone number) and a record of the conversation with the contractor.
- b. Would the applicant be willing to arrange a conference call between this contractor, the CEC, and CURE? If your answer is no, please explain why not.
- c. Please identify the source of the assumed stack height.
- d. The response to CURE Data Request 10 indicates that the stack temperature and exhaust gas flow rate assumed for the drill rig engines was based on information for a fire water pump provided in attachment CDR-10. Please provide all information that supports the assumption that the engines on the fire pump and drill rig engines are sufficiently similar to warrant this substitution.
- e. We observed a drill rig in operation at the Leathers facility from January 7 through January 10, 2003. During much of this time, there was very little wind. We observed dark black puffs of smoke and very little plume rise. Both conditions are inconsistent with the assumptions used to model drill rig emissions in the AFC. Please reconcile the discrepancy between the PM10 emission factor of 0.27 g/bhp-hr, assumed exhaust temperature and flow rates, and the presence of a visible, black plume and absence of significant plume rise.
- f. The response to CURE Data Request 16 indicates that drill rig modeling assumes that the rig engines operate at

44.3% of full load. This would result in lower stack gas temperatures, exhaust flow rates, and thus plume rise, than assumed in the modeling. Please provide all information, including the cited contractor's data that justifies the use of 100% load stack parameters and 44.3% load for emission calculations.

281. The applicant indicated in response to CURE Data Request 14 that it would not be willing to accept a COC that requires the use of drill rig equipment consistent with the Applicant's modeling assumptions, e.g., four 450-hp engines with a 14-foot high, 8-inch diameter stack, exhausting 2,340 acfm at 955 F. In response to CURE Data Request 15 for an explanation of why the Applicant is unwilling to accept its modeling assumptions as a COC, the applicant refers to its response to CURE Data Request 9. However, the response to CURE Data Request 9 only addresses drill rig emissions, not drill rig modeling parameters. If the applicant is confident that its characterization of drill rig modeling parameters is accurate, it is not obvious why the applicant would not be willing to accept these as a COC and verify them through a source test. Thus, please explain with specificity why the applicant is not willing to accept its modeling input assumptions as COCs. Please support your answer with source tests, permits, and all other relevant information.
282. CURE Data Request 23 pointed out that there was a discrepancy between the number of pieces of equipment assumed in Tables G-3.1 and 3.4-2. The response claims that transmission line emissions are included in Tables G-3.1 to G-3.5 but excluded in Table 3.4-2, accounting for the discrepancy. However, the AFC does not contain an equipment inventory nor equipment usage schedule for the transmission line. However, this claim is not consistent with the construction schedule in Table 3.4-1, the construction equipment usage in Table 3.4-2, nor the emission inventory in Table G-3. For example, the response to CURE Data Request 31 indicates that the following equipment is included in the emission inventory for the transmission line: pickup trucks, fuel truck, flatbed trucks, dozer, trencher/backhoes, crane-45T, and compressors. As discussed below, comparing Tables G-3 with the schedule in Table 3.4-1 and the equipment usage in Table 3.4-2 indicates that the equipment used to construct the transmission

line does not appear to be included in Table G-3 emissions. Examples of the inconsistencies follow.

Table 3.4-1 indicates that excavation, foundation preparation, and structure assembly for the transmission line would occur in months 8 through 15. These activities require the use of dozers, trenchers/backhoes, compressor, and cranes. However, Tables G-3 indicate that the emissions from this equipment during this period are based on only the number of dozers, trenchers/backhoes, compressor, and 45T cranes shown in Table 3.4-2, which, according to the Applicant, lists the equipment to construct everything but the transmission line. Because Table 3.4-2 excludes transmission line equipment, Tables G-3 and 3.4-2 combined indicate that no dozers, trenchers/backhoes, 45T cranes, or compressors would be used to construct the transmission lines, contrary to applicant's claim in response to CURE Data Request 31. However, more equipment is included in the emission inventory in Tables G-3, than shown in Table 3.4-2, for months 18 to 26, a period when Table 3.4 - 1 indicates that most transmission line installation will be complete. Other transmission construction activities, including shieldwire and conductor stringing and cleanup only occur in months 16 to 18 and would not require any dozers, trenches/backhoes, cranes, or compressors, but rather a large number of specialized trucks that are not shown anywhere in the inventory. Dozers, however, may be required for cleanup and rehabilitation, occurring in months 19 to 21. Thus, apparently, there is an error in the schedule shown in Table 3.4-1, or the emission inventory does not include transmission line emissions.

Further, the emissions in Tables G-3 are based on two more pickup trucks and one more flatbed truck than shown in Table 3.4-1, while the same number of fuel trucks and water trucks are shown, suggesting the transmission line would be built with only two pickup trucks and one flatbed truck. As previously noted in CURE Data Request 31, construction of the transmission line would require concrete delivery trucks, pole delivery trucks, cable/conductor delivery trucks, bucket trucks, drum puller trucks, dual tensioner trucks, and at least two cranes. The use of only two more pickup trucks and one more flatbed truck is also inconsistent with Figure 3.4-1, which shows many more trucks are used in conductor stringing, including five drum pullers, a rope puller, a tensioner, and a conductor reel truck. Further, the Project schedule

in Figure 3.4-1 shows that construction of the Project site, wells, pipelines, and transmission lines would all overlap. As a result, a single water truck and fuel truck could not service all construction sites simultaneously.

Please provide a construction equipment usage table, comparable to Table 3.4-2, for the transmission line and please revise the emissions in Tables G-3 to include all of the additional equipment.

283. CURE Data Request 24 requested all justification for using on-road emission factors for off-road dump trucks. The applicant responded that a dump truck is “most appropriately characterized as a Class 7 (MHDT) diesel vehicle category for analysis with the EMFAC2002 model,” but did not provide any justification for why it believes an off-road dump truck is most appropriately characterized as an on-road vehicle for the purpose of measuring emissions. On-road and off-road engines are primarily tested with steady-state test methods although steady-state operation is not always representative of the operation of engines in many off-road applications for which emissions are generally much higher. Thus, the U.S. EPA has developed factors to adjust steady state emission factors to off-road engines in transient operation. Hydrocarbon emissions increase by a factor of 1.4, CO emissions by a factor of 2.0, and PM10 emissions by a factor of 1.6.¹ Please explain why the applicant believes there is no need to adjust the Class 7 EMFAC emission factors for off-road vehicles used in non-steady-state operation.
284. The background to CURE Data Request 26 explained that off-road construction equipment emissions in Table G-3 were based on the SCAQMD CEQA Handbook, Table A9-8-B, rather than Table A9-8-A, as recommended in the SCAQMD CEQA Handbook. In response, the applicant argued that the data in Table A9-8-A “is no longer available as a recommended source,” claiming “Table A9-8-B is more appropriate.” This is not wholly accurate for two reasons. First, the U.S. EPA website at <http://www.epa.gov/otaq/ap42.htm> indicates that “[t]here are no current plans to update AP-42 [Compilation of Air Pollutant Emission Factors, Volume II: Mobile

¹ M. Beardsley and C. Lindhjem, Exhaust Emission Factors for Nonroad Engine Modeling -- Compression-Ignition, EPA Report No. NR-009A, Revised June 15, 1998, Appendix C. Available at www.epa.gov.

Sources] for nonroad emission factors. However, in response to the requirements of the 1990 Clean Air Act amendments, EPA in the early 1990s conducted the “Nonroad Engine and Vehicle Emission Study” (NEVES), in which a great deal of more recent information on nonroad mobile source emissions is presented. Information on NEVES is available at <http://www.epa.gov/otaq/nonrdmdl.htm#neves>.

Second, the data in Table A9-8-B that the applicant relied on is based on the 1991 NEVES study, which itself has been superceded by a series of U.S. EPA reports found at <http://www.epa.gov/OMS/models/nonrdmdl/nr-009a.pdf> for compression engines, at <http://www.epa.gov/OMS/models/nonrdmdl/nr-010b.pdf> for spark ignition engines and at <http://www.epa.gov/OMS/models/nonrdmdl/nr-005a.pdf> for information on median life, annual activity, and load factor values. These reports indicate that the steady-state diesel emission factors from the NEVES report relied on by SCAQMD must be multiplied by an in-use factor for CO, VOCs, and PM. (NEVES, Table 1, Appx. C.) Further, PM10 emission factors for off-road sources based on this more recent work are generally higher than most of the PM10 emission factors assumed in Table G-3. Finally, many of the load factors are higher than assumed in the SCAQMD tables.

- a. Please revise the construction emissions in Table G-3 and related analyses to follow the most current U.S. EPA guidance.
 - b. If the applicant selects newer engines for the revised calculations in Data Request 284a than assumed in the NEVES study, please indicate whether the applicant would be willing to accept a COC requiring the use of engines that meet the assumed emission factors.
 - c. If the applicant is not willing to accept a COC committing to the use of newer engines than assumed in the NEVES study and used in the Applicant’s construction emission analysis , please explain why not.
285. The applicant estimated construction equipment emissions in Table G-3 by multiplying an emission factor in pounds per horsepower

hour (“lb/hp-hr”) by both a fuel usage factor and a load factor. However, the load factor is estimated from the hours of usage per year, the fuel consumption per year, and the fuel consumption rate at rated power and thus, already includes fuel usage. (See, for example, Lindhjem and Beardsley June 15, 1998 and U.S. EPA November 1991.) Therefore, the load factor already includes fuel usage, and emissions were underestimated by the additional reduction in fuel usage.

- a. Please revise the construction equipment emissions in Tables G-3 to eliminate this improper use of an additional fuel usage factor.
 - b. If you decline to revise the Table G-3 emissions in subpart (a), please justify your decision and provide all supporting information.
 - c. If you decline to revise the Table G-3 emissions in subpart (a), please support the usage factors in Table G-3, which note 6 indicates are based on “Design Engineer.” Please provide a copy of all information provided by the Design Engineer.
286. In response to CURE Data Request 29, the applicant stated that it would not be willing to accept the use of CARB diesel as a COC, even though the applicant uses lower PM10 factors, which assume the use of CARB diesel, in estimating off-road construction emissions, arguing that CARB diesel “is the only available diesel in California for mobile equipment.” At the workshop on January 9, 2003, CURE explained that, CARB diesel is only required for on-road diesel equipment, not off-road equipment, which was the subject of CURE Data Request 29. Non-CARB diesel with much higher sulfur is available in California, Arizona, and Mexico at reduced cost compared to CARB diesel. Thus, is the applicant willing to accept a COC that requires the use of CARB diesel in off-road construction equipment, including stationary equipment? If your answer is no, please explain why not, provide all supporting information, and identify the source of the diesel that you propose to use.
287. The response to CURE Data Request 32 indicates that the equipment required to construct the pipeline is included in Table

3.4-2. However, Table 3.4-2 does not identify many of the types of equipment normally required for pipeline construction, including pipe-stringing trucks, bending machines, welding trucks, welding rigs, coating trucks, mechanics rig, a parts van, and x-ray truck, among others. Thus, please breakout specifically the equipment that would be used to construct the pipelines in a separate equipment usage table, comparable to Table 3.4-2, and provide a description of pipeline construction methods that would be used.

288. CURE Data Request 34 noted that idling emissions were only included for PM10 from delivery trucks, but not for any other construction equipment. The applicant responded that idling would be limited to 5 minutes “to the extent feasible” and that idle emission rates are included in EMFAC2000 emission factors and therefore, “idle emissions need not be separately included...”
Please respond to the following questions on this issue:

- a. If the applicant proposes to limit idling time to five minutes to the extent feasible, does the applicant agree that idling time may be longer than 5 minutes in some circumstances?
- b. If the answer to subpart (a) is yes, please explain under what circumstances idling time may be longer than 5 minutes and provide a worst case analysis.
- c. If the answer to subpart (a) is no, please explain how a 5 minute idling cap will be enforced. Is the applicant willing to accept this enforcement procedure as a COC? Will it be included as a contract condition and written on blueprints? If your answer is no to any of the questions in subpart (c), please explain your answer and provide all information that supports it.
- d. The EMFAC2000 model only provides emission factors for on-road vehicles. The emission factors used for all off-road construction equipment in Tables G-3 does not include idling emissions. These can be substantial if multiple 5 minute periods are accumulated by a large number of pieces of equipment during the workday. Thus, please provide an estimate of idle emissions for construction

equipment shown on the bottom half of Table G-3, starting with concrete pump and ending with welders.

289. CURE Data Request 36 requested the emission factors used to estimate well flow run emissions in Table G-14 and any supporting data, including source tests and brine and steam composition data assumed in the emission calculations. The response provided a sample calculation for PM10 for a production well and an injection well, explaining that “[e]mission factors were not used to determine emissions.” CURE Data Request 36 also requested “any supporting data, including source tests and brine and steam composition data assumed in the emission calculations.” The sample calculations provided in response to CURE Data Requests 36-38 indicate that produced fluid total dissolved solids (TDS) and steam properties were used in the calculations. However, the assumptions used in the sample calculations are inconsistent with Figure 3.3-9. Thus, please provide the following additional information to clarify the emissions in Table G-14:

- a. The sample PM10 calculations indicate that the produced fluid composition data used in the sample calculation differs from that presented in Table 3.3-1 (TDS = 231,606 mg/L vs. 235,000 mg/L in Table 3.3-1). The resulting injection well emissions, 51.2 lb/hr, are lower than the 56 lb/hr shown in Table G-14 and are inconsistent with the ratio of TDS. Thus, please provide the brine composition data used to calculate the emissions in Table G-14 and resolve the discrepancy in emissions between Table G-14 and the response to CURE Data Request 36.
- b. The sample PM10 calculations assume a well flow rate of 1,200,000 lb/hr while Figure 3.3-9 indicates a well flow rate of 1,276,800 lb/hr. The vent tank emission calculations, in Table G-15, are based on a well flow rate of 1,280,000 lb/hr, consistent with Figure 3.3-9. Please resolve the discrepancy between the steam flow rate used in the sample PM10 calculations and the steam flow rate used elsewhere.
- c. Please support the basis of the flash fractions for HP flash, SP flash, LP flash, and ATM flash, as reflected on Figure 3.3-9 with engineering calculations.

- d. The sample PM10 calculations assume that 1% of the steam flow is brine. Presumably, the cooling tower blowdown contains the residual brine associated with the steam. Table 3.3-2 indicates that the TDS of the cooling tower blowdown is 1,168 mg/l, or 1.2%. Please resolve the discrepancy between these two figures and explain the basis for the 1% brine carryover value that was used in the TDS sample calculations. Support your answer with engineering calculations and/or test data.
 - e. Please provide comparable sample calculations for the noncondensable gases to those provided in response to CURE Data Requests 37 and 38.
290. The vent tank emissions in Table G-15 are based on 50 hours of 100% brine flow. What is the basis of the 50 hours? Please support your answer with at least 5 years of actual operating data from existing facilities.
291. The emission inventory does not include any emissions from wells during well drilling. The response to CURE Data Request 43 claims that these emissions are negligible. However, we observed significant steam venting on January 8 to 10, 2003, during the drilling of an injection well for the Leathers facility.
- a. Please explain the source of this steam and why you believe it would not contain brine carry-over solids and volatilized constituents from the drilling mud. Please support your discussion with engineering calculations and test data.
 - b. Please provide an MSDS for the drilling mud that will be used to drill Project wells.
292. CURE Data Request 44c requested the composition of the cooling tower circulating water, including the contribution from chemicals added to control scale and biological growth. The response in CDR-44 shows that 884 lb/hr of scale inhibitor is added.
- a. Please identify the inhibitor and provide an MSDS.

- b. Table 3.3-9 shows that 141 lb/day of sulfonated carboxylated polymer, TRASAR, would be added to the circulating water. If this is the scale inhibitor that would be used, please resolve the discrepancy between the 884 lb/hr shown in CDR-44 and the 141 lb/day shown in Table 3.3-9.
 - c. Table 3.3-9 indicates that 94 lb/day of bio-detergent and 7,260 lb/day of 12% sodium hypochlorite would also be used for cooling tower treatment. These chemicals are not shown in CDR-44. Please revise CDR-44 to include all chemicals that would be added to the circulating water and provide an MSDS for each.
293. The response to CURE Data Request 46a reports SO₄ emissions from the cooling tower of 2.02 lb/hr. However, CDR-44 shows SO₄ emissions per cooling tower cell of 0.1012 lb/hr. There are 10 cells. Thus, CDR-44 indicates that total cooling tower emissions would be 1.01 lb/hr. Please resolve discrepancy.
294. The response to CURE Data Request 46b and 46c declined to analyze emissions and ambient air concentrations for PM_{2.5} and PM₁₀ by stating that the standards are not final. Although the implementation of these standards was delayed due to litigation, the standards were recently upheld and implementation is underway. In June 2002, California revised existing PM₁₀ standards and adopted a new standard for PM_{2.5}. The State lowered the annual PM₁₀ standard from 30 µg/m³ to 20 µg/m³ and adopted a new annual PM_{2.5} standard of 12 µg/m³. (See California Air Resources Board (CARB), Resolution 02-24, p. 3-4, June 20, 2002; CARB Notice of Public Availability of Modified Text, Attachment A, p. A-6, August 15, 2002; CARB Second Notice of Public Availability of Modified Text, Attachment A, p. A-6, October 10, 2002.)² These new PM₁₀ and PM_{2.5} standards are substantially lower than the federal equivalents and are now final.

Furthermore, the California Environmental Quality Act (CEQA) requires the lead agency to analyze potentially significant public

² A specific level for a 24-hour-average PM_{2.5} standard was deferred, based on the need to review epidemiological studies, in light of the difficulties with the use of statistical software in several key studies. (CARB, Resolution 02-24, p. 4, June 20, 2002.)

health impacts from PM₁₀ and PM_{2.5} emissions from the proposed project. Under CEQA, standards or thresholds that have been adopted to protect the environment are used to determine the significance of project impacts. Where an applicable standard exists, an environmental change which does not comply with the standard is considered significant. “Standard” is defined to include a quantitative requirement found in a statute, ordinance, resolution, rule, regulation, order, or other standard of general application. (14 Cal. Code Reg. § 15064(h).) As noted above, the State’s new annual PM₁₀ standard of 20 µg/m³ and new annual PM_{2.5} standard of 12 µg/m³ was adopted in State of California Air Resources Board 02-24 Resolution on June 20, 2002. Therefore, please expand the emission inventory and modeling analysis to include the following:

- a. Emissions and ambient air concentrations for PM_{2.5}.
 - b. Revised PM₁₀ air quality impact analysis based on the recently revised California annual PM₁₀ AAQS.
295. CURE Data Request 46d asked for a cumulative air quality analysis that includes existing geothermal facilities. The applicant responded that a cumulative analysis was reported in AFC Section 5.1.3. However, this analysis only calculated the cumulative increase of SS6 and one other new facility. CURE seeks to clarify that it seeks an analysis or description of the baseline. Because there is no recent on-site or nearby H₂S ambient air quality data to use as a background and the existing geothermal facilities are the principal source of H₂S, these existing facilities should be included, cumulatively, in a baseline analysis. Therefore, please prepare a H₂S air quality analysis that includes all of the existing geothermal facilities.
296. The response to CURE Data Request 47 indicates that background H₂S “was established by information provided by Mr. Harry Dillon of the Imperial County Air Pollution Control District.” Please provide a copy of all information that Mr. Dillon provided to the applicant.
297. We believe that when Unocal owned the existing geothermal facilities, ambient H₂S concentrations were measured using a network of fence-line monitors.

- a. Is the applicant aware of any historic ambient H₂S monitoring data?
 - b. If the answer to subpart (a) is yes, please provide a copy of all known ambient H₂S data.
298. The response to CURE Data Request 50 indicates that the 10 ppb background NH₃ concentration used in the visibility analyses is based on typical background values for grasslands. This value was uniformly applied between the Project site and Joshua Tree National Park, 177 km to the north. However, much of this and nearby areas to the south are occupied by land uses that would emit much larger amounts of NH₃ than grasslands, including principally agricultural lands, dairies, geothermal facilities, and heavily traveled roadways (NH₃ is emitted from the tailpipe of vehicles), among others. Therefore, please support this choice by providing the results of a literature survey on ambient NH₃ concentrations representative of these land uses and/or the results of an ambient monitoring program to determine more representative background NH₃ concentrations.
299. The response to CURE Data Requests 51 to 53 claims that the Project's NH₃ contribution is included in the background NH₃ concentration of 10 ppb by virtue of having picked the highest background NH₃ concentration associated with several types of native vegetation. However, as noted above in CURE Data Request 298, local land uses would likely emit far more ammonia than native grasslands. Further, the annual average Project contribution, based on the applicant's modeling, ranges from 30 ppb to 37 ppb. Thus, it is unlikely that the Project's contribution to NH₃ background has been properly included in the visibility analyses. Please specifically estimate the Project's contribution to background ammonia, based on the modeling performed for the public health analysis.
300. In response to CURE Data Request 59b, the applicant claims that fugitive emissions from pumps, valves and flanges would be minimized through a maintenance program. Please provide the following information on this program:

- a. Please describe the fugitive emission maintenance program that would be implemented. If a specific program has not yet been designed for this Project, please provide a copy of the maintenance program currently followed at existing facilities and identify any anticipated changes.
 - b. Is the applicant willing to accept a COC that requires the use of the maintenance program described in subpart (a) as a COC. If your answer is no, please justify your answer and identify a program that you would be willing to accept.
 - c. Please support your conclusion that fugitive emissions are insignificant by providing the results of fugitive emission monitoring at existing facilities that are subject to a maintenance plan.
301. CURE Data Request 221 requested an estimate of fluorine emissions, supporting calculations, and a fluorine material balance. The response reported that all of the emissions were “0.00.” However, no supporting calculations were provided. Instead, the response refers to CEC Data Response 54, which does not contain any supporting calculations. Thus, please provide engineering calculations and a material balance that support the conclusion that fluorine emissions from all sources are zero.
302. CURE Data Request 222 requested an engineering calculation and a boron material balance to support the boron emissions from the cooling tower in Table G-7. The response claims that the boric acid concentration in the drift is not directly proportional to the TDS and refers to CEC Data Response 54, which does not contain the requested information. Please provide the following additional information:
- a. Please explain why boric acid is not directly proportional to TDS in the cooling tower drift. Support your answer with engineering calculations and direct measurements.
 - b. Please provide an engineering calculation that supports the boron emissions from the cooling towers in Table G-7.

- c. Please provide a boron material balance that shows all boron sources and sinks.

- 303. The Geotechnical Report in Appendix J indicates that deep foundations will be required to reduce ground settlement, which will require pile driving. (See, for example, AFC, pages 3-26 to 3-29 and 5.11-6.) Table 3.4-2 does not identify pile drivers. Construction emissions in Appendix G do not include emissions from pile drivers. Thus, please provide the following additional information:
 - a. Please revise Table 3.4-2 to include pile drivers.
 - b. Please identify and describe the type of pile drivers that will be used. Your response should include the following:
 - i. vendor literature
 - ii. horsepower rating
 - iii. noise controls
 - iv. emission factors
 - c. Please revise the construction emissions in Table G-3 to include pile drivers.

WASTE MANAGEMENT

304. The response to CURE Data Request 64 states that the composition of filter cake shown in Table 3.3-6 was estimated by calculating the mean concentration of analyses from existing plants and refers to attachment CDR-63 for the supporting data. However, CDR-63 is a MSDS and does not contain the supporting data. CDR-62 contains four annual filter cake analyses, one each for Elmore, Leathers, Region 1, and Region 2. Please provide the following additional information on your response:
- a. Should the response to CURE Data Request 64 have referred to CDR-62 instead of CDR-63?
 - b. If the answer to subpart (a) is yes, the average of the four samples provided in CDR-62 is not consistent with Table 3.3-6. Thus, please provide a copy of all analyses that were relied on to develop the filter cake composition data in Table 3.3-6 and justify your choice of analyses.
 - c. If the answer to subpart (a) is no, please provide a copy of all analyses that were relied on to develop the filter cake composition data in Table 3.3-6 and justify your choice of analyses.
305. CURE Data Request 65 requested filter cake TCLP and solids analyses for the previous 1 year for each of the existing geothermal facilities in the Salton Sea area. The response claims that the data is provided in attachment CDR-62. However, this attachment only contains four annual analyses for four facilities. According to the response to CEC Data Request 92b, Table 5.10-12R1, 120 tons of filter cake would be generated and hauled away from the Project site every day. The AFC claims that 95% of this material is nonhazardous. A daily analysis would have to be performed to determine where to send the waste. Thus, even though the existing facilities are smaller than the Project, it appears that much more frequent analyses than the annual data provided in CDR-62 must exist for the existing facilities to determine whether to ship each truck load of filter cake to a hazardous or nonhazardous waste landfill.

- a. Please provide a complete set of STLC and TTLC analyses, comparable to those provided in attachment CDR-62, for the most recent year for each existing geothermal facility.
- b. If your answer to subpart (a) claims that all existing analyses were provided in attachment CDR-62, please explain why only annual analyses are performed and support your answer with a table that provides the following:
 - i. Summarizes the estimated quantity of filter cake that was generated at each existing facility for each of the immediately previous 5 years;
 - ii. Identifies its destination (hazardous or nonhazardous waste facility, and name of facility);
 - iii. Identifies the number and type of trucks used to transport the material; and
 - iv. Provides all evidence upon which you justify sending filter cake to a nonhazardous waste facility.
- c. The AFC, pp. 1-4 and 3-2, indicate that there are nine geothermal power plants within a 2-miles radius of the proposed plant site. Please explain why filter cake data was only provided for four facilities.
- d. Is the filter cake that is produced at existing geothermal facilities comparable to that which will be produced by the Project? If your answer is no, please identify all differences and explain the basis for the differences, including all supporting calculations, data and other information you have to justify the answer.
- e. Please describe the procedures that will be used by the Project to generate, store, test, load into transport vehicles, and transport filter cake. Your response should answer the following:
 - i. Whether any filter cake will be stored on site and if so, how long, where, and in what type of containers;

- ii. The equipment that will be used to transfer the filter cake from the filter press to storage or transport vehicles;
 - iii. The frequency of sampling, the location where samples will be collected (e.g., from each truck, or each container), the method that will be used to collect the samples; and
 - iv. The procedure(s) that will be used to decide whether to send the filter cake to the monofill or a hazardous waste landfill.
306. CURE Data Request 66 asked for 5 years of historic data summarizing the relative amount of filter cake that was disposed as hazardous and nonhazardous waste. The response refers to AFC, page 3-17, and the responses to CURE Data Requests 64 and 68. This is not responsive because none of these three sources contains any of the requested information. CURE therefore clarifies its request. Please provide 5 years of data that shows the amount of filter cake that was disposed of as hazardous and nonhazardous waste from each of the existing geothermal units. The response should include a table that identifies each of the 9 existing units, the split in waste classification for each of the past 5 years, or one entry for each year between 1998 and 2002, and all of the supporting data, including daily or more frequent analyses.
307. CURE Data Request 68 requested “all engineering calculations, historic data, and chemical composition data and all assumptions that were relied on to determine that 95% of the filter cake is nonhazardous.” The response contains none of this information, instead stating with no support that “[t]he split is based on a review of historic information regarding total filter cake produced on an annual basis, monofill disposal information and hazardous waste disposal manifests.” Please provide a copy of all of the information relied on in this quoted passage from Response to CURE Data Request 68.
308. CURE Data Request 70 requested an analysis of the impacts of an accident involving a filter-cake truck, or, alternatively, all of the information required to prepare such an analysis. In the workshop

on January 8, 2003, the applicant indicated that it had pursued the latter alternative, to provide the information required to prepare such an analysis. However, the response only refers to CEC Data Request Response 92, which only contains information on the number of trucks. This is not sufficient to prepare an analysis of the impacts. Thus, please provide the following additional information:

- a. Destination and route of trucks;
 - b. Frequency of accidents involving waste trucks servicing existing geothermal facilities;
 - c. Frequency of accidents involving hazardous waste trucks in general;
 - d. A list of historic accidents involving filter cake trucks and all related information, e.g., reports prepared by agencies or owners of the facilities; and
 - e. A description and evaluation of historic accidents identified in subpart (d).
309. The response to Data Request 71a indicates that the monofill identified in the AFC (e.g., Fig. 3.1-3) only accepts nonhazardous waste. The AFC claims that the filter cake is hazardous 5% of the time. Thus, please identify the landfills that have been historically used and will be used in the future to dispose of hazardous filter cake.
310. The Project will generate about 2,500 tons of scale per year. CURE Data Request 73b sought support for the 2,500 ton/yr estimate and chemical composition data. The response stated that the quantity of scale was calculated from the amount of piping in the facility and other equipment surfaces through which brine flows and scale adheres to. Thus, please provide the following additional information:
- a. The engineering calculation referenced in the response that was used to arrive at 2,500 ton/yr.

- b. At least 1 year of historic data from existing facilities that supports the chemical composition data provided in attachment CDR-73.
311. The response to CURE Data Request 73c indicates that scale will be removed by hydroblasting on a concrete pad with concrete walls. Please provide the following additional information about this process:
- a. Engineering drawings of the hydroblasting area that shows it in cross section and plan view.
 - b. A description of the controls that will be used to prevent the escape of contaminated vapors into the environment.
 - c. A description of the controls that will be used to protect workers.
 - d. How frequently will scale be removed?
 - e. Hydroblasting will require that pipelines and other equipment be disassembled and reassembled, generating construction noise, air emissions, and biological impacts. The AFC does not appear to have considered these periodic, maintenance impacts. Thus, please prepare an analysis of the noise, air quality, soil, and biological impacts of scale removal.
 - f. Pipelines and equipment would have to be disassembled to remove scale. This could result in the spill of contaminated brines and solids onto the ground. Please describe the procedures that would be used to minimize spills during maintenance activities.
 - g. Is the applicant willing to accept a COC that requires the implementation of subparts (a), (b), (c) and (f)? If your answer is no, please explain why not.
312. The Phase I Environmental Site Assessment (“ESA”) concluded that there would be possible impacts from historic application of organochlorine pesticides and chlorinated herbicides. Lands that were farmed before these chemicals were banned, as is the case

here, frequently contain elevated concentrations of these pesticides that are high enough to pose a significant health risk to exposed construction workers. Thus, please perform a Phase II ESA that measures organochlorine pesticides and chlorinated herbicides in all soils that would be disturbed by Project construction. The Phase II ESA should use EPA Method 8270, should collect surface samples from the top 2 inches of soil, should not composite samples, and should include at least 30 separate samples.

313. The AFC indicates that workers would be trained to identify contaminated soil and on proper procedures for handling such soils. (AFC, p. 5.13-2.) CURE Data Request 175a asked specifically for procedures that would be used by workers to identify pesticide-contaminated soils. The response cites two sections of the California Code of Regulations (“CCR”) that would be followed. However, these sections only train workers to identify contaminants that can be observed or smelled. Similarly, the response to CURE Data Request 175b only addressed stained or odiferous soils. Pesticide-contaminated soils cannot be detected using the procedures outlined in the AFC or the CCR.
- a. Please explain how workers will be trained to identify pesticide-contaminated soils that cannot be observed or smelled and the procedures that will be implemented to prevent worker exposure to these soils.
 - b. Is the applicant willing to accept a COC that implements its response to CURE Data Requests 175a and 175b? If your answer is no, please provide all supporting information you have to justify your answer.
314. CURE Data request 176g asked whether the mud pits associated with existing wells located on the 160-acre parcel are still present. The response discusses Regional Water Quality Control Board (“RWQCB”) procedures, but does not provide a yes or no answer.
- a. Are the mud pits associated with the existing geothermal wells located on the 160-acre parcel still present? Please provide a yes or no answer.

- b. If your response to subpart (a) is yes, please locate the mud pits and the geothermal wells on Figure 3.1-2 and provide specific coordinates, e.g., latitude and longitude.

WATER RESOURCES

315. CURE Data Request 75 asked for site-specific values for potential evaporation (p), average hourly daytime traffic (d), time between watering applications (t), and application intensity (i). The response refers to CURE Data Response 4, which does not contain potential evaporation (p) or average hourly daytime traffic (d). Thus, please provide the potential evaporation (p) for the site and the average hourly daytime traffic (d) during construction.
316. The AFC indicates that freshwater water demand is based on the assumed salinity of the geothermal brine. The Project would ordinarily use about 293 acre feet per year (“afy”) of IID canal water, based on an assumed brine salinity of 23.5%. However, “in the very unlikely event that the salinity reaches the maximum of 25.0%, the corresponding water demand could reach 987 afy.” (AFC, p. 5.4-8.) The response to CURE Data Request 77 stated that the upper limit of 25% includes recognition of the gradual increase in brine TDS. CURE Data Request 78 asked for all data that supported the TDS assumptions used to estimate freshwater demand. The response summarized the data but did not provide it.
- a. Please provide a copy of all data, calculations, and references you relied on in responding to CURE Data Requests 77 and 78 regarding your answer that the upper limit of 25% includes recognition of the gradual increase in brine TDS.
 - b. Your response to CURE Data Request 80 indicates that TDS data from 24 wells in three regions was used to develop an expected average brine salinity of 23.5% and upper limit of 25% for the SSU6 wells. Is this the same data that you relied on in your response to CURE Data Request 78? If your answer is no, please provide any additional data that you relied on in Response to CURE Data Request 80.
317. CURE Data Request 84 asked for all information, including IID irrigation water delivery data and annual cropping patterns, that supports an annual average consumptive water demand of 5 ac-ft/ac for crops historically grown on lands that would be taken out of production by the Project. The response provided a January 28,

2002 memorandum from the IID in attachment CDR-84. Please respond to the following questions on this memorandum:

- a. The 5 ac-ft/ac consumptive water demand is based only on data for the period 1987 to 1995. Please extend the analysis through the end of 2002.
 - b. The memorandum does not provide annual cropping patterns, as requested in CURE Data Request 84. Please provide annual cropping patterns for the years 1996 through 2002.
 - c. The January 28, 2002 memo indicates that “we have not used any year of zero water use in the baseline calculations.” This would appear to result in overestimating baseline consumptive water use and thus underestimating net increase in water demand due to the Project. Please provide the complete data set, including all zero water use fields and/or years, from 1987 through 2002.
 - d. The January 28, 2002 memo indicates that the data used to develop 5 ac-ft/ac “are preliminary estimates only and are subject to revision as the rules governing the On-Farm Program are finalized.”
 - i. Have these values been modified since the January 28, 2002 memo? If your answer is yes, please provide all revisions.
 - ii. Has the On-Farm Program been finalized? If your answer is yes, please describe the Program and indicate whether it would affect the estimated water demand.
 - e. Please provide copies of all correspondence and notes of telephone conversations regarding historical and existing water use between the applicant, its consultants, and the IID.
318. The response to CURE Data Request 86 reconciled the Agriculture and Soils section of the AFC, which indicates only 97 acres would be

taken out of agricultural production (AFC p. 5.3-12), with the Water Resources section, which assumes 173 acres would be taken out of production (AFC, p. 5.4-8), by stating that “the Water Resources Section of the AFC indicating 173 acres is correct.”

- a. Please confirm that the reference to 97 acres in the Agriculture and Soils section is incorrect with a yes or no answer.
 - b. If the answer to subpart (a) is yes, please provide a revised analysis of impacts to agriculture and soils.
 - c. If the answer to subpart (a) is no, please provide all justification you have for your answer.
319. CURE Data Request 85 asked for support for the estimate of 173 acres of fallowed land. The response refers to Table 5.3-3 of the AFC, which only supports 97.2 acres.
- a. Please reconcile the discrepancy between Table 5.3-3 and the water demand calculations in Section 5.4.2.1.2 (AFC, p. 5.4-8), which are based on 173 acres.
 - b. The water delivery data in attachment CDR-84 is based on only 144 acres, rather than the 173 acres used in the demand calculations. The consumptive use estimate of 5 ac-ft/ac should have been based on the same area that would be fallowed. Thus, please provide all water delivery data for the years 1987 to 2002 for the entire area that would be fallowed.
320. CURE Data Request 87 asked the applicant to identify a backup water supply if Sections 4.1 and 4.3 of the Water Supply Agreement resulting in curtailment of the Project’s primary supply were implemented. The response suggests that these sections could never be triggered. Please respond to the following questions on this issue:
- a. Please explain why these sections are included in the Agreement if they would never be triggered.

- b. If IID receives an order or directive from a governmental authority reducing the volume of water allocable to IID from the Colorado River, such as the Secretary of Interior's recent order imposing a 330,400 acre-foot reduction in IID's water supply, is it possible that IID may reduce the project's water supply pursuant to Section 4.3? Please answer yes or no.
- c. If your answer to subpart (b) is no, please provide all justification for your answer.
- d. Section 4.1 of the Agreement appears to allow curtailments if deliveries exceed 1.5 cfs per day at gates 459 or 460 or 3.0 cfs per day from both gates combined. Response to CURE Data Request 87 indicates that the applicant expects a maximum use rate of 1 to 2 cfs per day. The response and discussion in the workshop on January 8, 2003 suggest that only the 3.0 cfs per day cap applies.
 - i. Please provide correspondence with IID or other documents that support the applicant's interpretation of this section of the Agreement.
 - ii. Is it possible that the applicant will receive all of its water through each of the following: gate 459? gate 460? gate 459 plus gate 460?
- e. Section 4.3 of the Agreement appears to allow curtailments if IID's Colorado River supply is reduced, which has recently occurred. The response to CURE Data Request 87 claims that this section will not result in a curtailment due to the ratio limitation in Section 4.3. Please clarify the ratio limitation, including all assumptions and information supporting your answer, by providing the following, assuming a 20% curtailment in Colorado River supply:
 - i. Ratio of reduction in the Maximum Use Amount to the total reduction of water allocable to IID from the Colorado River.

- ii. Ratio of Maximum Use Amount to the current total amount of water allocable to IID from the Colorado River.
 - iii. Please explain why the ratio in subpart (i) could never exceed the ratio in subpart (ii).
 - f. If brine salinity reaches 25% and the corresponding water demand reaches 987 afy, as described in Response to CURE Data Request 77, please confirm that an 11% reduction in IID's supply would result in an inadequate water supply for the project.
321. CURE Data Request 93 asked for historic releases from the brine ponds. The response indicates that no releases have occurred from other similar brine ponds at existing units 1-5 in the last 5 years.
- a. Are there any existing similar brine ponds?
 - b. If your answer to subpart (a) is no, please detail the differences between the existing brine ponds and the proposed brine ponds.
 - c. Please provide all information you have on historic releases over the past 5 years from all existing brine ponds. For each release, please provide the date of the release, the cause of the release, the size of the release, the composition of released fluids, the environmental consequences of the release, actions taken to cleanup the release, and change(s) made in pond design and operation to prevent similar future releases.
322. CURE Data Request 95 asked for a compilation of pipeline releases over the past 10 years, including the date of the release, the amount of fluid released, the cause of the release, the environmental consequences of the release, the steps taken to cleanup the release, and any changes in design that were implemented to prevent similar future releases. The response in attachment CDR-95 provided the date, amount of fluid released, and location of the release, but none of the other requested data.

- a. The list of releases in attachment CDR-95 covers the period 1995 to 2002, a 6 year period. Did any releases occur between 1990 and 1995? If your answer is yes, please provide all of the information asked for in CURE Data Request 95 for each release.
- b. The list of releases in attachment CDR-95 is incomplete. For example, releases of hazardous materials must be reported to the Governor's Office of Emergency Service (OES). A recent search of the hazardous materials spill database identified a release of 13,000 to 15,000 gallons on December 8, 2002. Please explain why this release was excluded from CDR-95, revise CDR-95 to include it, and update CDR-95 through the present, to include, among others, the release that occurred January 7-8, 2003 and any other releases that were not reported to OES.
- c. Does the applicant have any information on the cause of the releases identified in CDR-95 and subparts (a) and (b)? If your answer is yes, please provide a copy of all information.
 - i. Has a release ever been caused by a collision involving farm equipment? If your answer is yes, how many such events have occurred in the last 10 years?
- d. Does the applicant have any information on the environmental consequences of the releases identified in CDR-95 and subparts (a) and (b)? If your answer is yes, please provide a copy of all information you have on the environmental consequences of the releases.
- e. Does the applicant have any information on the steps taken to cleanup the releases identified in CDR-95 and subparts (a) and (b)? If your answer is yes, please provide a copy of all information.
- f. Does the applicant have any information on design changes that were implemented to prevent similar future releases? If your answer is yes, please provide a copy of all responsive information.

- g. Based on our observation, it appears that the residue from the January 7-8 release was collected by hazardous waste trucks and disposed in the brine pond at the Elmore facility.
 - i. Please state whether this observation is correct with a yes or no answer.
 - ii. If the answer to subpart (i) is no, please answer the following:
 - 1. Describe the owners and operators of the hazardous waste trucks that were discharging into the Elmore brine ponds on January 8-10, 2003.
 - 2. Explain why the hazardous waste trucks were discharging into such pond on that date.
 - 3. Describe the specific residue (e.g., brine-contaminated soil, brine fluids) that was put in the brine pond.
 - iii. If the answer to subpart (i) is yes, please identify the specific residue (e.g., brine-contaminated soil, brine fluids) that was disposed?
 - iv. If the answer to subpart (i) is yes, were the residues characterized prior to disposal in the brine pond? If your answer is no, please explain why not. If your answer is yes, please provide a copy of all resulting analytical data.
 - v. Will spill residues be disposed in the brine ponds of the Project? If your answer is yes, under what conditions?
- h. Please indicate how the volume of each spill in CDR-95 was determined? If this information is not available, please describe, in general, how spill volume would be estimated.

- i. Please provide a copy of all reports prepared in response to the releases in CDR-95, including, but not limited to, all reports made to the Governor's Office of Emergency Response.
 - j. The response to CEC Data Request 10 states that the amount of brine released to the ground would typically be 200 to 400 gallons and the response to CEC Data Request 24 states that the maximum release would be 1,050 gallons. The 45 releases in CDR-95 average 1,315 gallons and include seven releases larger than 1,050 gallons, ranging up to 16,000 gallons. Please resolve the discrepancy between CEC Data Response 10 and CURE Data Response 95.
323. CURE Data Request 97c asked for a copy of the Containment, Control, and Cleanup procedures that would be used to mitigate pipeline releases. The response indicates that emergency response/contingency plans will be in place prior to the start of construction.
- a. Please describe the procedures that are currently used to contain, control, and cleanup pipeline releases. Provide a copy of any written procedures.
 - b. Does the applicant anticipate any changes in the procedures described in subpart (a) at Salton Sea Unit 6? If your answer is yes, please describe all changes and explain their basis.
324. The Project is within the 100-year flood zone and is surrounded on three sides by 100-year flood zones. (Response to Data Adequacy Comments, p. WATER-13, FIRM map.) The entire site will be enclosed by an 8-foot high perimeter berm. The northern and western portions of the dike already exist, but apparently not the balance of the dike. (AFC, Appx. J, p. 3.) The AFC concluded that the 8-foot dike would eliminate potentially significant flooding impacts of the Project and thus provided no analysis of flooding impacts. (AFC, p. 5.4-9.) However, surrounding the Project site with an 8-foot high berm would remove 80 plus acres from the floodplain, increasing the base flood elevation outside of the berm

and thus aggravating flooding impacts elsewhere. Response to CURE Data Request 100 claims that “removal of 80 acres will have an insignificant effect on the flood plain volume, as 80 acres is a very small portion of the entire 102,887 acre area.” However, local flooding impacts, in the immediate vicinity of the Project, outside of the berm, would likely be significant. Thus, please estimate the local increase in flood elevation in the immediate vicinity of the Project. Please recommend mitigation for the impact, e.g., provide an equivalent volume of flood plain volume elsewhere. Please provide supporting calculations and all other information that supports your conclusion.

325. CURE Data Request 102 asked for chemical composition data for several streams that are routed to the brine ponds. The applicant provided part of the requested information, but omitted others. Thus, please provide chemical composition data for the following:
- a. Liquids from thickener
 - b. Bermed area
 - c. In the January 8, 2003 workshop, the applicant admitted that it had failed to provide chemical composition data for the condensate steam tanks.
 - i. Thus, please provide chemical composition data for the condensate steam tanks.
 - ii. Are the condensate steam tanks the same as the emergency relief tanks?
326. CURE Data Request 103 asked for an estimate of the frequency of discharge to brine ponds, the length of time wastes would remain in the ponds, and the annual average amount of each of the following streams discharged to the brine ponds: reverse osmosis reject; liquids from the thickener, bermed areas around plant equipment, and emergency relief tanks; and startup and drilling brine, based on operating experience at the existing Units 1-5. The response claims existing operating experience is not relevant because the design of the redundant brine ponds for Unit 6 is different than at the existing facilities. However, the design of the brine ponds affects accidental releases *from* the ponds, not discharges *to* the

ponds. The design of the geothermal facility itself would affect discharges into the ponds. Presumably, the design of the geothermal facilities is sufficiently similar that operating experience at the existing brine ponds is representative of the proposed brine ponds. Certainly, operating experience at existing ponds is more representative and useful than no information at all. Finally, there should be a design estimate for the Project for all of the requested information.

- a. Please provide the information requested in CURE Data Request 103. If you believe discharges to the existing brine ponds are not relevant, please document the differences in the facilities that you believe preclude the use of existing data on discharges to the brine ponds and provide all information that supports your answer.
- b. If you responded to subpart (a) by documenting the differences, please provide the design basis for each requested parameter for the Project.

327. CURE Data Request 104 asked for a sample calculation that shows how the brine pond composition data in Table 3.3-2 was estimated and to support your answer with volumes and chemical composition data. The response does not contain a sample calculation, volumes, or chemical composition data, stating only that brine pond composition is derived from brine composition assuming 26% flash. This is not responsive. Thus, please provide the following information:

- a. Please provide calculations that support the brine pond composition data in Table 3.3-2. The calculations should be prepared for several constituents that span the range of assumptions (e.g., TDS, H₂S, As, NH₄) and should identify all assumptions, including volumes and brine composition data that were used in the calculations.
- b. If the brine pond composition was calculated assuming 26% flash of brine, as claimed in the response to CURE Data Request 104, the brine pond composition does not include any of the other streams that would be routed to the ponds. Thus, please revise the brine pond composition

in Table 3.3-2 to include all streams that would be routed to the ponds.

328. The Water Quality Control Plan for the Colorado River Basin encourages practices that conserve water. (Water Quality Control Plan, Colorado River Basin – Region 7, p. 1-4, 4-1.) The surface pond proposed to contain freshwater supply would appear to be inconsistent with water conservation. Response to CURE Data Request 113 states that an open pond was selected because it is a better solution based on flood management, maintenance, reliability, and cost. Please provide the following additional information on this issue:
- a. Please provide a copy of the analysis and all supporting information that concludes that an open pond provides flood management, maintenance, reliability, and cost benefits.
 - b. Please identify the flood management benefits provided by the open pond.
 - c. Please identify the maintenance benefits provided by an open pond.
 - d. Please explain why an open pond is more reliable than a tank.
 - e. Please provide a cost analysis for a tank and the open pond, if not otherwise provided in response to subpart (a).
329. Solids would accumulate in the brine ponds and be removed periodically. CURE Data Request 121d and 121e asked for a description of the procedures that would be used to remove and dispose of brine pond solids. The response refers to Section 3.3.4.4.2 of the AFC, which does not describe the procedures. Please describe the procedures that would be used to remove and dispose of brine pond solids. Your description should include at least the following:
- a. How frequently will solids be removed?

- b. Will the solids be temporarily stored? If your answer is yes, identify the type of container, location of containers, and length of storage.
 - c. What procedures will you use to prevent spills of brine pond solids during removal and placement in storage?
 - d. Identify the equipment that would be used to remove the solids, including type of fuel and horsepower of engine.
 - e. Will the applicant contract the services or do the work in-house?
330. CURE Data Response 157 provided chemical composition data for the RO inlet, outlet, and reject stream in attachment CDR-157. This attachment indicates that no Selenium (Se) would be present in the RO feed, RO permeate, or RO reject. However, Colorado River water contains about 2 ppb of Se,³ which would be concentrated in the reject to concentrations that may be high enough to pose a hazard to wildlife. Thus, please revise CDR-157 to include Se concentrations greater than zero, or explain why the Project's IID supply would contain no Se. Please support your answer with chemical analyses of the proposed water supply.
331. CURE Data Response 160 indicates that continued IID supply is anticipated at the end of the 21-year life of the Water Supply Agreement. Please provide a copy of the will-serve letter for the last 9 years of the 30 year Project lifetime. If you do not provide a copy of the will-serve letter, please confirm that you have no current committed arrangement for continued IID supply beyond 21 years.
332. The Project would include 10 production wells and 7 injection wells. How many of each type of well would have to operate simultaneously to produce 180 MW of electricity? Please provide all information you used to support your answer.

³ See, for example, the Salton Sea Database at www.lc.usbr.gov and Setmire et al., Detailed Study of Water Quality, Bottom Sediment, and Biota Associated with Irrigation Drainage in the Salton Sea Area, California, 1988-90, USGS Water-Resources Investigations Report 93-4014, 1993.

333. Poster boards containing useful descriptive information on the Project and geothermal resource⁴ have been displayed at the public workshops. We were informed during the November 19, 2002 site visit that a copy of these poster boards would be posted on the CEC website. They have not been posted to date. Thus, please provide a copy of these poster boards.

⁴ Refined Conceptual Modeling and a New Resource for the Salton Sea Geothermal Field, Imperial Valley.

BIOLOGY

334. Based on comments made during the workshop on January 9, 2003, CURE understands that at least a portion of the agricultural field where proposed well pads OB1 and OB2 will be located will be removed from production. At present, this field is managed by the Sonny Bono National Wildlife Refuge (“Refuge”). The well pads and the pipelines will remove at least 42 acres on this field from production.⁵ This field is one of only four refuge-managed fields specifically planted to provide forage to several resident and migratory bird species. Removal of portions of this agricultural field and the associated loss of foraging habitat for resident and migratory birds were not evaluated in either the AFC or the responses to data requests.

Further, biological impacts of removing a total of 173 acres of agricultural land from production were not analyzed in either the AFC or the responses to data requests. This agricultural land, managed by the refuge or planted for production, currently provides foraging opportunities for many migratory and resident bird species, many of which are listed as federal and/or state endangered or threatened species. The removal of this agricultural land may have an adverse impact on a large number of birds due to reduction of feeding grounds.

- a. Please provide an analysis of impacts regarding the removal of 173 acres of agricultural land from production – and specifically the removal of 42 acres from production from the agricultural field at proposed well pads OB1 and OB2 – on resident and migratory birds with particular focus on the fully protected Yuma clapper rail, California Species of Concern, and each endangered and threatened species under federal and/or state law. Please include a

⁵ Response to CEC Data Request 28, Table 5.5-DR: total habitat impacted by production wells: 26.2 acres; two of five well pads are located on the agricultural field in question, thus, 10.4 acres will be removed by OB1 and OB2. The production pipelines will impact 94.9 acres of habitat; more than a third of the production well pipelines are proposed to be located on the agricultural field in question, thus, at least 31.6 acres will be removed by production pipelines. The acreage removed by the well pads OB1 and OB2 adds up to a total of 42.0 acres.

description of the current use of this foraging habitat by birds.

335. The location of well pad OB1 adjacent to Union Pond, a freshwater marsh that is Yuma clapper rail habitat, and the location of OB3 on Obsidian Butte, adjacent to a potential brown pelican nesting site and wetlands, may result in significant disturbance impacts during construction, operation, inspection, and maintenance of the well pads and associated pipelines. Ongoing disturbances during operation of the project, *e.g.*, presence of humans, noise from maintenance operations, lights from maintenance vehicles, and vibration due to well operation near the periphery of Union pond may force Yuma clapper rails deeper into their already very limited habitat (*i.e.* deeper into Union Pond) or cause the rails and pelicans to abandon their nests or nesting attempts. Albertson, for example, documented a clapper rail abandoning its territory in Laumeister, a 36-ha marsh in the San Francisco National Wildlife Refuge, shortly after a repair crew worked on a nearby transmission line.⁶

Disturbance alters activity budgets and increases energy expenditures. When potential threats are detected, birds shift their time and energy from other behaviors to increased vigilance behaviors. Increased vigilance directly translates into less foraging time and reduced fat reserves. Both breeding and non-breeding seasons are critical times for the Yuma clapper rail. Disturbance during the breeding season (March through October at Salton Sea⁷) translates to less time spent brooding eggs or nestlings and may result in increased embryo/nestling mortality due to thermal intolerance (reduced nest shading by adults) or predation. Disturbance that occurs after chicks have left their nests may still result in reduced reproductive success. Chicks emulate the adult's vigilance behaviors and spend less time feeding. Fat reserves are critical for birds during the post-fledge period, when they are feeding on their own without guidance or assistance from adults.

⁶ J.D. Albertson, Ecology of the California Clapper Rail in South San Francisco Bay, M.A. Thesis, San Francisco State University, 1995.

⁷ D.A. Bailey, K.H. Rodenbaugh, V.M.J. Ryden, P.B. Schumann, P.M. Merifield, W.D. Dritschilo, Enhancement of Habitats for the Yuma Clapper Rail and Desert Pupfish, In the Vicinity of the Salton Sea, Environmental Science and Engineering, University of California Los Angeles, Report No. 83-52, February 1983.

Disturbance during the non-breeding season that causes vigilance or movement by the birds again results in reduced feeding or resting time and a net increase in energy loss. Avoidance behaviors such as running or flushing result in even greater energy expenditure and more depleted fat reserves. The ultimate effect of depleted fat reserves is reduced survival or reproduction, regardless of age, species of bird, and/or timing of disturbance.⁸ Thus, Yuma clapper rail may be adversely impacted due to the location of well pad OB1 adjacent to its habitat.

- a. Please provide an impact analysis of the location of proposed well pad OB1 adjacent to Yuma clapper rail habitat with respect to disturbance from human activity in the vicinity, noise from maintenance operations, lights from maintenance vehicles, and vibration caused by well operation near the periphery of Union pond. The response should address both breeding (March through October) and non-breeding (November through February) seasons, both of which are recognized as critical times for the Yuma clapper rail. Non-breeding season impacts are exacerbated in small diked marshes, such as Union Pond, in which there is little to no high tide refugia or high marsh plain.
- b. Please provide an impact analysis of the location of proposed well pad OB3 adjacent to a potential brown pelican nesting site with respect to disturbance from human activity in the vicinity, noise from maintenance operations, lights from maintenance vehicles, and vibration caused by well operation.

336. The response to CURE Data Request 187 regarding an analysis of project construction and operational impacts on Yuma clapper rail species inadequately analyzed potential impacts from noise. The AFC states that “[n]oise impacts would be considered significant if the power plant project-related operations activities increased noise by 5 dbA above the lowest measured L₉₀ at *any* noise-sensitive receptor.” [Emphasis added]. Clearly, the Yuma clapper rail is a sensitive receptor and relevant background noise levels and

⁸ Letter from J. Knight, U.S. Fish and Wildlife Service, to L. Sutton and J. Olberding, Re: Proposed Breuner Marsh Restoration Project, Richmond, Contra Costa County, February 14, 2002.

increases due to project operation ought to be assessed. Estimated Project operational noise contours at 45 decibels extend into the Yuma clapper rail habitat (AFC, Figure 5.11-3). However, the noise measurements provided in the AFC are not adequate to establish background noise levels at the Yuma clapper rail habitat and, consequently, to determine significant impacts on Yuma clapper rail.

First, the closest noise measurements to the Yuma clapper rail habitat were performed at proposed well pads OB1 and OB2 at 5 feet off the ground surface (AFC p. 5.11-4). No specific noise measurements were performed at ground-level, close to the Yuma clapper rail habitat where the most sensitive noise receptor would be located. The present noise level at ground-level is likely lower at the Yuma clapper rail habitat because a small berm between Union Pond and the proposed well pad location currently reduces noise.

Second, measurements at well pads OB1 and OB2 were taken on just one day and for 10 minutes only, a meaningless time period to adequately determine existing average noise levels at a site and in particular to determine a lowest measured L_{90} . The 10-minute L_{90} at OB1 was determined between 9 and 11 am on a weekday in June of 2001 at 51.1 dBA and at OB2 at 44.7 dBA. Lower L_{90} -values could be present during different times of the day or different days of the week. The same incorrect measure of the baseline applies to the measurements at the proposed plant site, where only two 1-hour measurements were conducted on one day, also in June 2001. Noise levels may vary considerably from weekdays to weekend days as a result of increased visitor traffic on weekends to the Refuge and due to private, domestic, agricultural, and military airplane traffic. Further, noise levels may vary significantly during the harvesting and planting seasons due the presence or absence of operating agricultural equipment, including crop dusters, tractors and harvesters. Noise levels during the night are likely lower than during the day, when many of these activities take place. Since noise impacts are considered significant if the project-related operations activities increase noise by 5 dBA above the lowest measured L_{90} at any noise-sensitive receptor, the lowest L_{90} must be determined. To determine the lowest L_{90} -value, noise measurements should be conducted during the night and during time periods of low activity.

- a. Please conduct, at a minimum, 25-hour noise measurements at the Yuma clapper rail habitat, at the proposed well pad OB1, and at the proposed plant site on both a weekend day and a weekday to determine the lowest L₉₀.
 - b. Based on the noise measurements obtained per the above data request, please provide an updated noise assessment for the construction and operational phase of the project, and provide all data supporting your assessment. Please provide estimated noise contours for the plant site as well for well pad OB1 and OB2 for both the operations and the construction phase of the project.
337. Responses to CURE Data Requests 187 and 228 state that noise levels within the clapper rail habitat as a result of plant construction would range from 51 to 70 dBA and that Yuma clapper rail will be significantly impacted during breeding season. No specific information was given on how these numbers were derived. Because Yuma clapper rail is an endangered species under the federal Endangered Species Act (“ESA”), any impact that constitutes a take, which is defined as including harassment of birds, is not allowed. Harassment under Section 9 of the ESA includes any kind of behavioral changes, such as change in habitat use, change of foraging or sleep pattern, interference with vocal communication of birds, and certainly extends to forced dispersal of the birds caused by construction noise and vibration. Forced dispersal can increase predation risk and mortality.

Numerous mitigation measures exist for noise from construction equipment. Examples include the installation of exhaust mufflers on all equipment including impact tools, earthmoving equipment, and hand-held pneumatic tools, substitution of hydraulic or electric impact tools for combustion impact tools, substitution of sonic (or vibratory) pile drivers for impact pile drivers, and installation of enclosures around pile drivers and stationary equipment.

- a. Please provide all noise data and the calculations used for estimating construction noise levels of 51 dBA to 70 dBA at the Yuma clapper rail habitat.
 - b. Please provide a list of all mitigation measures that the applicant agrees should be conditions of certification to reduce the level of noise from plant construction including the anticipated noise reduction for each type of equipment.
338. The AFC proposes compensation land acquisition (AFC, BIO-24, p. 5.5-31) to mitigate project impacts to Yuma clapper rail and wetland areas and states that “the [a]pplicant is evaluating areas near the project site to mitigate project impacts to Yuma clapper rail and wetland areas.” The Salton Sea shoreline is heavily utilized by agriculture and not much suitable habitat remains. The most suitable areas for mitigation had been determined along the southern shore of the Salton Sea (southeast to southwest). The west shore and the Whitewater River region had previously been determined unsuitable for mitigation.⁹ It is critical that the habitat identified for mitigation purposes is free from threats that could contribute to population declines in the future.
- a. Please identify available suitable habitat for compensation land acquisition. Please provide a detailed description of the size and habitat qualities of the identified site(s) including the nature and magnitude of any threats that would be present on the site(s).
339. The response to CURE Data Request 190 regarding cumulative impacts to Yuma clapper rail was that the applicant believes that “the analysis of cumulative impacts to the Yuma clapper rail [in the AFC] is complete and accurate.” However, only noise and the removal of habitat were addressed. A number of potentially adverse impacts related to project construction and operation were not addressed and ought to be considered in an impact analysis. Such potential impacts include vibration from construction

⁹ D.A. Bailey, K.H. Rodenbaugh, V.M.J. Ryden, P.B. Schumann, P.M. Merifield, W.D. Dritschilo, Enhancement of Habitats for the Yuma Clapper Rail and Desert Pupfish, In the Vicinity of the Salton Sea, Environmental Science and Engineering, University of California Los Angeles, Report No. 83-52, February 1983.

equipment during the construction phase and from operation of the plant, bright lights which illuminate the plant at night during construction and operation, removal of the buffer zone and foraging area between the project facilities and the Union Pond, and brine spills into the wetland, agriculture and/or adjacent areas. Therefore, please provide a full impact assessment for the Yuma clapper rail and each federal and/or state endangered or threatened species and species of concern, including vibration, light from the plant site and during construction, brine spills, and removal of the buffer zone and foraging area between the project facilities and the Union Pond, and provide all data supporting your assessment.

340. The AFC (Appendix K, p. 16-2) states that “[i]f practicable, the steam blow process will be scheduled to coincide with the non-breeding season of the Yuma clapper rail.” This does not rule out the chance that a steam blow may occur during the Yuma clapper rail breeding season (March through October), forcing rails to abandon their nests, which would constitute a significant impact to breeding birds that could directly affect the survival of the species.

Further, the typical noise level of a steam blow has been estimated at approximately 102 dBA (response to CEC Data Request 17, Table BIO 17C). Supposedly, the proposed use of a silencer would provide attenuation of the typical 102 dbA to approximately 58 dBA. The typical noise level during a steam blow is not, however, the relevant measure, rather it is the highest noise level generated during a steam blow.

- a. Please provide the range of sound pressure levels generated by steam blows.
 - b. Please state whether the applicant would be willing to accept a condition that steam blows can only occur during the non-breeding season (November through February) and would be controlled with a silencer.
341. Regarding potentially significant adverse impacts to birds from brine ponds, response to CURE Data Request 216(a)(1) states that “given a choice of waters of various quality, it is likely that birds and small mammals would choose to drink less saline water” and further in response to CURE Data Request 216(d) that “[t]here is no risk, because the brine will cause taste aversion and involuntary

rejection.”

In several instances, brine ponds associated with mining and other operations with high salinities (exceeding those of the proposed Project brine pond) attracted large numbers of migratory birds.¹⁰ Many dead birds were observed in the ponds and bird mortality was directly related to the water stored in the brine ponds – the birds died from salt toxicosis. Birds did not necessarily die because they voluntarily drank the brine, but because when they landed, sludge and brine coated their feathers. They subsequently preened their feathers in an attempt to clean themselves, ingested some of the sludge and brine, and, as a consequence, died from salt toxicosis. Often, carcasses are removed by small predators, so the operator would not necessarily detect the dead birds. In other cases, dead birds have been found to sink quickly with carcasses accumulating at the bottom of the pond. These same observations have been made in oil field waste pits,¹¹ which are not a visually attractive place for birds to land either.

Because numerous federal and state listed endangered and threatened species are observed in the area, this issue should be of concern. Brown pelican, a federally listed endangered species, have in the past been observed by Refuge staff sitting at the banks of brine ponds associated with other geothermal facilities in the area.¹² Blue heron have been observed standing on the banks of the Leathers Plant utility pond, which is located immediately adjacent to the brine pond. At the same time, an American Coot was observed swimming in the utility pond.¹³ The location of the utility pond adjacent to the brine pond and the observations of birds suggest that birds will not be deterred by the location of the brine pond amidst large industrial structures as had been previously suggested in response to CURE Data Request 216(a).

¹⁰ See for example S. Hampton, J. Yamamoto, and D. Racine, Assessment of Natural Resource Injuries to Birds at Searles Lake, 1998 to 2001, San Bernardino County, CA, April 9, 2002.

¹¹ U.S. Fish and Wildlife Service, Contaminant Issues – Oil Field Waste Pits, <http://mountain-prairie.fws.gov/contaminants/contaminants1c.html>, accessed January 18, 2003.

¹² Conversation P. Pless with T. Andersen, Biologist, Sonny Bono Salton Sea National Wildlife Refuge, January 7, 2003.

¹³ Personal observation, P. Pless, January 8, 2003.

Considering the fact that bird casualties due to salt toxicosis have been observed at other similar brine ponds and that birds have been observed next to CalEnergy brine ponds in the past, please perform monitoring six months for at least 1 month during the peak migration season of the existing brine ponds at existing geothermal facilities in the area for use by birds. If birds are observed at or in the brine ponds, please perform a detailed risk assessment for birds and evaluate alternatives to uncovered brine ponds to deter birds from landing on the ponds, and provide all data supporting your assessment.

342. CURE Data Request 216 asked for references, surveys, and other information that support the claims that brine ponds do not pose a significant ecological risk to wildlife. The Response stated that “[w]hile insects are potentially more salt tolerant than vertebrates, they also have salt tolerances that are probably exceeded by the brine ponds.”

These “probable” insect salt tolerances are not supported by the literature. Brine flies and salt marsh mosquitoes have been found to withstand much higher salinities than those predicted for the brine ponds. The brine ponds at the proposed facility will have total dissolved solids (“TDS”) concentrations in excess of 215,000 ppm; salt tolerant insect larvae have been found to withstand TDS concentrations up to about 350,000 ppm.¹⁴

Given the evidence from scientific studies that some insect larvae are capable of surviving in waters with higher salinity than the water in the proposed brine ponds, please perform a detailed assessment of the impact of contaminants accumulation in the food chain and an analysis of potential impacts on birds and bats due to dietary uptake of insects, and provide all data supporting your assessment.

343. In response to CURE Data Request 219, the applicant “believes that there will be no dietary uptake of contaminants from the brine ponds by bats, as insects would be unlikely to survive and

¹⁴ For a summary see D. Richman, 1996, Most Saline Tolerant, Chapter 22 in Walker, T.J. (ed.), University of Florida Book of Insect Records, 2001.

reproduce in the brine.” As discussed above, insects may very well survive in the ponds and could thus provide a source of contaminated food through bioaccumulation to bats.

Given the evidence from scientific studies that some insect larvae are capable of surviving in waters with higher salinity than the water in the proposed brine pond, and as requested previously in CURE Data Request 219, please provide an assessment of the dietary uptake of contaminants by bats via bioaccumulation in insects, and provide all data supporting your assessment.

344. Response to CURE Data Request 196 states that “the Applicant has already proposed to implement measures to avoid significant impacts to the pupfish.” However, no specific measures are proposed in the AFC that would mitigate potential project impacts to the desert pupfish.

Please point out the measures in the AFC that specifically address significant adverse impacts to desert pupfish during construction and from potential operational impacts, including from brine spills from pipeline leaks.

345. The response to CURE Data Request 198 states that “rarely are burrowing owls observed as road-kill.” This statement is contrary to observation by Refuge employees,¹⁵ who frequently observe burrowing owls as road-kill along McKendry Road and other roads in the immediate vicinity of the proposed plant site.
- a. Please provide an analysis of potential impacts to burrowing owl and identify mitigation measures to prevent road-kill of burrowing owls during project construction and operation.
346. Burrowing owls are noted for their ability to co-exist with man and frequently use man-made structures. For example, during pre-construction surveys, a burrowing owl was observed using a plastic duct along the proposed transmission line route (AFC, Photo 22, p. 5.5-63). During construction of the plant, various hollow construction materials such as pipes and ducts would be stored on

¹⁵ Conversation with Charles Pelizza, Senior Wildlife Biologist, Tom Andersen, Biologist, Sonny Bono Salton Sea National Wildlife Refuge, January 7 and 8, 2003.

site for varying time periods, allowing burrowing owls to use these objects unless they are enclosed, capped, or elevated off the ground so they are not accessible. This could result in inadvertent killing of individual birds when the materials are moved.

- a. Is the applicant willing to accept a COC that requires measures to make hollow construction materials such as ducts and pipes inaccessible for use by burrowing owls, (e.g., caps, elevating off ground, enclosure)? If no, please explain why not.
347. The AFC provides estimates of bird abundance in the greater project area based on so-called avian flyover analyses (AFC, Appendix K, p. 3-8 ff.). These surveys were performed to determine how many birds are potentially at risk from new facilities and transmission lines. The AFC does not provide a detailed description of the methodology, e.g., date or time of day, distance, observation angle, etc. Many migratory birds use the Salton Sea as a stopover or wintering ground. Thus, the number of birds observed will vary considerably depending on the time of year the survey is conducted. Further, many migratory birds fly at night and will not be counted by daytime flyover analyses. Surveys designed to assist in predicting the risk to birds should therefore include seasonal as well as night-time components.
- a. Please provide a detailed description of the flyover survey methodology including the survey protocol, survey dates and time of day, observation distance or angle, etc.
 - b. Please provide an assessment of the potential risk from new facilities and powerlines to birds that fly at night and all data supporting your assessment.
348. Brown pelicans, a federally listed endangered species, as well as many other bird species, have frequently been found dead along power lines. In the past, up to three dead birds per week have been found along one power line, located near the Union Pond. Refuge staff also reported frequent finds of dead birds under other power lines, e.g., along Sinclair Road.¹⁶ Of particular concern is the L-Line interconnection within less than 1000 feet of the shoreline

¹⁶ Id.

(Figure 5.5-1A). A small marsh area at the shoreline where birds are loafing is located where the transmission line comes closest to the shore. Refuge staff has expressed concern about avian collisions in this area,¹⁷ especially for pelicans, which require a long distance to take flight. The AFC proposes that “bird flight diverters will be installed ... [i]n [seven] locations where the number of birds flying perpendicular to the proposed line exceeded 30 individuals.” No other mitigation measures were proposed.

- a. Response to CURE Data Request 211(e), regarding the proposed mitigation measure to “under-build” transmission lines, claimed that “IID transmission facilities (161 kV) do not allow for under-built distribution or communication circuits.” Please explain why IID transmission facilities do not allow for under-built construction of power lines.
 - b. In the past, the IID proposed to install orange markers between pole spans and stated that “if these measures do not stop 100 percent of the bird mortality, the District will install the distribution line underground.”¹⁸ Please evaluate the alternative of placing the L-line interconnection underground. Please support your answer with both an engineering and cost analysis for both the proposed and alternative configurations.
349. The electrocution of raptors and other large perching birds is a well-studied hazard of overhead transmission lines. Electrocution hazards can be greatly reduced through modifications to existing design standards. The location of the proposed transmission lines associated with the Project in an area of high use by a large number of federal and state endangered, threatened and rare bird species requires the evaluation of electrocution hazards due to power lines and the proposal of feasible mitigation measures.

Electrocution hazards for perching birds are related to phase-to-pole top clearance and the material of the pole construction, e.g., wood versus steel, concrete, or fiberglass poles.

¹⁷ Id.

¹⁸ Salton Sea National Wildlife Refuge Complex, Imperial Irrigation District Powerline Taking Brown Pelicans, Memorandum, January 19, 1993.

Several mitigation measures exist to reduce the number of casualties related to electrocutions associated with powerlines. These measures include installation of plastic pole-top caps, installation of fiberglass pole-top pins to increase the phase-to-pole top clearance, replacement of steel crossarms on steel poles with wood or fiberglass crossarms to reduce conductance, installation of perch guards, and insulation of phase-to-ground clearance on steel poles with thermoplastic polymer wrapping, or providing a better place to land.¹⁹

Further, studies show that wind direction relative to powerline crossarm orientation affects the probability of electrocution of raptors which perch on top of the poles: “Crossarms mounted perpendicular to the wind allow raptors to easily soar away from the structure and attached wires. Raptors taking off from crossarms mounted parallel to prevailing winds can more easily be blown into energized conductors. Wind orientation presumably places inexperienced fledgling birds at greatest risk.” (Harness 2000²⁰). Prevailing winds at the plant site blow from west and west southwest (AFC, Figure 5.1-2). The proposed L-line interconnection runs parallel to and in parts within 1,000 feet of the Salton Sea shoreline, thus positioning the crossarms parallel to the prevailing wind direction.

¹⁹ R. Harness, Raptor Electrocutions and Distribution Pole Types, Technical Bulletin, North American Wood Pole Coalition, October 2000.

²⁰ Id.

- a. If the Applicant suggests that undergrounding is not feasible, please provide an assessment of raptor casualties from electrocution as a result of the proposed transmission line poles and provide all data supporting your assessment.
 - b. If the Applicant suggests that undergrounding is not feasible, please detail all mitigation measures the applicant is willing to accept as conditions of certification to prevent raptor casualties related to the proposed powerlines.
 - c. Please provide an analysis of an alternative routing of the L-line interconnection to reduce the likelihood of impacts on birds.
350. The applicant proposes to defer development of mitigation plans for various impacts to some time in the future. The AFC (Appendix K, p. 16-2) states that a “construction noise assessment will be conducted during final design to determine practicable mitigation measures to minimize noise impact to occupied clapper rail habitat.” Further, response to CURE Data Request 211(d) regarding avian collision and/or electrocution associated with transmission power lines states that a “monitoring plan *may* be developed.” (Emphasis added.)

This approach is problematic for several reasons. The deferral of developing a mitigation plan until the project is approved removes the California Energy Commission from its decision-making role. Further, impacts should be considered at a point in the planning process where real flexibility remains. The development of a mitigation plan cannot be deferred until the final design of the plant.

- a. Please provide a mitigation plan for impacts due to construction noise on Yuma clapper rail.
- b. Please provide a monitoring plan for avian collision and/or electrocution due to transmission lines.

351. Obsidian Butte serves as a quarry for the Imperial Irrigation District. Brown pelicans have in the past attempted to nest on the islands off of Obsidian Butte.²¹ Proposed well pad OB3 is located close to the quarry. Construction as well as operation of the well pad will increase the level of disturbance at the pelican nesting site, e.g., through increase of noise. The AFC does not contain a description of the quarrying activities.
- a. Please provide baseline information about current IID quarrying activities at Obsidian Butte including volume of rock quarried, frequency of use, noise levels, etc.
 - b. Please assess the potential impact of well pad OB3 construction and operation on brown pelican nesting, and provide all data supporting your assessment.
352. Brine pipelines are under pressure and a spill could conceivably spurt from the pipeline into the wetland. A recent spill of geothermal brine occurred on the night of January 7th to 8th from the pipeline to one of the injection wells located at the edge of the Refuge between Garst and Hatfield Roads between the Leathers and Elmore plants. The dimension of the area affected by the spill was estimated at the time at 5 feet by 100 feet.²² During the “data response and issues workshop” on January 9, 2003, the applicant indicated that the double-lined section of the pipeline is designed with small overlap into the areas adjacent to the wetland. Depending on the length of this overlap and the pipeline pressure, it is conceivable that a break of the single-walled pipeline close to the wetland could result in brine fluid spouting from the leak into the wetland.

²¹ Conversation with Charles Pelizza, Senior Wildlife Biologist, Tom Andersen, Biologist, Sonny Bono Salton Sea National Wildlife Refuge, January 7 and 8, 2003.

²² Personal communication, Silvia Pelizza, Project Leader, Sonny Bono Salton Sea National Wildlife Refuge, January 8, 2003.

- a. Please provide to-scale drawings of the pipeline segment that runs from well pad OB3 to the plant site. The drawing should precisely locate the wetland area.
 - b. Please provide an estimate of wellhead pressure and pipeline pressure decrease with distance from the production well and with distance from the facility for injection well pipelines.
 - c. Please estimate the area affected by a spill from a typical and worst-case pipeline break. Please support your estimate with engineering calculations and references to all assumptions. Please provide all data, assumptions and calculations that you use to support your answer.
353. Response to CEC Data Request 24 describes the technologies and procedures that will be in place at OB3 and along the OB3 pipeline to reduce spill volume. This response states that the 25-second response time of the proposed pressure control valves along the pipeline would limit the discharge to 1,050 gallons before full containment is achieved. The response also states that the total entrapment capacity of the outer pipe is 9,680 gallons. Please provide the following additional information on spill control procedures:
- a. Please present an engineering calculation that supports the estimated 1,050 gallon maximum spill for OB3. Identify all assumptions and include all information that supports your answer.
 - i. Does this spill volume only apply to the segment of OB3 that crosses the wetlands or does it apply along the entire length of OB3?
 - ii. Does this spill volume apply to other pipelines? If your answer is yes, which ones?
 - iii. Please resolve the discrepancy between the estimated maximum of 1,050 gallon spill and the actual spill sizes documented in CDR-95.

- iv. Will the Project be designed to prevent large spills, such as those documented in CDR-95? If your answer is no, please explain why not. If your answer is yes, please describe all design features that will be included in the Project to prevent releases larger than 1,050 gallons.
- b. Please present an engineering calculation that supports the estimated 9,680 gallon total entrapment capacity of the outer pipe. Identify all assumptions and include all information that supports your answer.
- c. Please provide a piping and instrument diagram (“P&ID”) of the OB3 pipeline that shows all of the valves, flanges, tees, turns, headers, double-walled pipelines, containment chambers, and any other design features that may affect the spill volume anywhere along the pipeline. If other pipelines differ significantly from OB3, please also provide a P&ID diagram for a typical section(s) of pipeline elsewhere in the facility.
- d. Response to CEC Data Request 24 states that Rexa actuator-controlled pressure control valves would be used to limit the size of a spill. Please provide vendor data sheets that describe these valves and support their 25-second response time.
 - i. Will these valves be used only in the portion of the OB3 pipeline that crosses the marsh?
 - ii. If the answer to subpart (i) is no, please identify all other locations that will use 25-second pressure control valves.
 - iii. If the answer to subpart (i) is no, will these valves be uniformly spaced along pipelines? If your answer is yes, what is the typical distance between 25-second shutoff valves? What is the maximum distance between 25-second shutoff valves?

- iv. Is the applicant willing to accept a COC that requires the use of the Rexa valves to minimize spill volume? If your answer is no, please explain why not.
 - v. Do existing pipelines employ automatic valves to limit the size of a spill? If your answer is yes, please identify all other pipelines that use automatic valves.
 - e. Please estimate the maximum spill volume from pipeline segments that are not outfitted with 25-second Rexa actuator-controlled pressure control valves and identify the pipeline segments that your estimate applies to.
 - f. Please evaluate alternate OB3 pipeline routes, selected to avoid proximity to sensitive habitat.
 - g. Would the applicant be willing to relocate OB3 to avoid the wetland area?
 - h. Please provide detailed engineering drawings of the segment of OB3 that will pass over the wetlands. The drawing should show the length and diameter of the inner and outer chambers and juxtapose the double-walled section over the wetland area.
354. The OB1 and OB2 pipelines are very close to sensitive habitat within the Sonny Bono National Wildlife Refuge. In the workshop on January 8, 2003, the applicant claimed that spills from these pipelines would not affect the Refuge or the Salton Sea. Please support this claim by providing the following information:
- a. Please identify all barriers, if any, between the pipelines and sensitive habitat including the Refuge, the Salton Sea and agriculture that would prevent spills from reaching such sensitive habitat.
 - b. The pipelines are pressurized. Please provide the average and maximum pressures expected in all pipelines, the rate of decrease of pressure as a function of distance from the wellhead, and an estimate the area that would be affected by a release from three typical-sized leaks and a worst-case scenario along each pipeline segment.

- c. Please evaluate alternate OB1 and OB2 well locations and pipeline routes, to avoid proximity to sensitive habitat.
 - d. Would the applicant be willing to relocate wells and pipelines related to OB1 and OB2 to avoid significant impacts of brine spills to sensitive habitat? If your answer is no, please support your answer.
355. Federal and state endangered desert pupfish have historically been found in agricultural drainage ditches and laterals around the project site. A brine spill above or close to these locations could potentially wipe out populations of desert pupfish.
- a. Please provide an explanation of why the proposed pipeline is only double-walled where it crosses the wetland but not in other sections.
 - b. Please calculate and describe the worst-case brine spill. Support your statement with engineering calculations including flow rate, pipeline diameter, length between shut-off valves, response time of valves, shut-off time of valves, etc.
356. Response to CEC Data Request 17 provided noise levels for a variety of construction-related activities and equipment (Tables BIO 17A through 17C). However, noise levels were not provided for all equipment listed in the AFC (AFC, Table 3.4-1). Further, the tables provided typical sound pressure levels only, not ranges. These typical values were selected from a 1971 EPA study and an unidentified study by Barnes et al. 1976. The relevance of using studies that are almost 30 years old is questionable as the design and size of construction equipment has since changed considerably. For example, Table 3.4-2 shows the use of 45, 60, 140, and 230 ton cranes for construction; Tables BIO 17A through 17C only provide noise levels for 11 to 20 ton-cranes.

- a. Please provide a copy of the Barnes et al. 1976 study.
 - b. Please provide ranges of sound pressure levels for all construction equipment.
 - c. Please provide ranges and typical sound pressure levels for all equipment listed in AFC Table 3.4-1 not currently included in response to CEC Data Request 17.
 - d. Is the applicant willing to accept a COC that requires the use of construction equipment that meets the noise levels assumed in the construction noise impact analysis? If your answer is no, please explain why not.
357. The Project infrastructure, including wells and transmission lines, would facilitate predator access to Union Pond, the Salton Sea shoreline, rookeries in the vicinity of Obsidian Buttes, and other sensitive areas by providing elevated perches that could be used for hunting. Please evaluate the impact of increased predation from elevated perches on all threatened and endangered species, and provide all data supporting your assessment and recommend mitigation to reduce the impact.

HAZARDOUS MATERIALS

358. The AFC does not provide a complete analysis for facility-upset conditions upstream of the hydrogen sulfide (H₂S) control equipment. Uncontrolled steam (containing high concentrations of gases such as H₂S and ammonia (NH₃) releases are not uncommon at geothermal power facilities, whether from emergency relief venting or equipment failure.

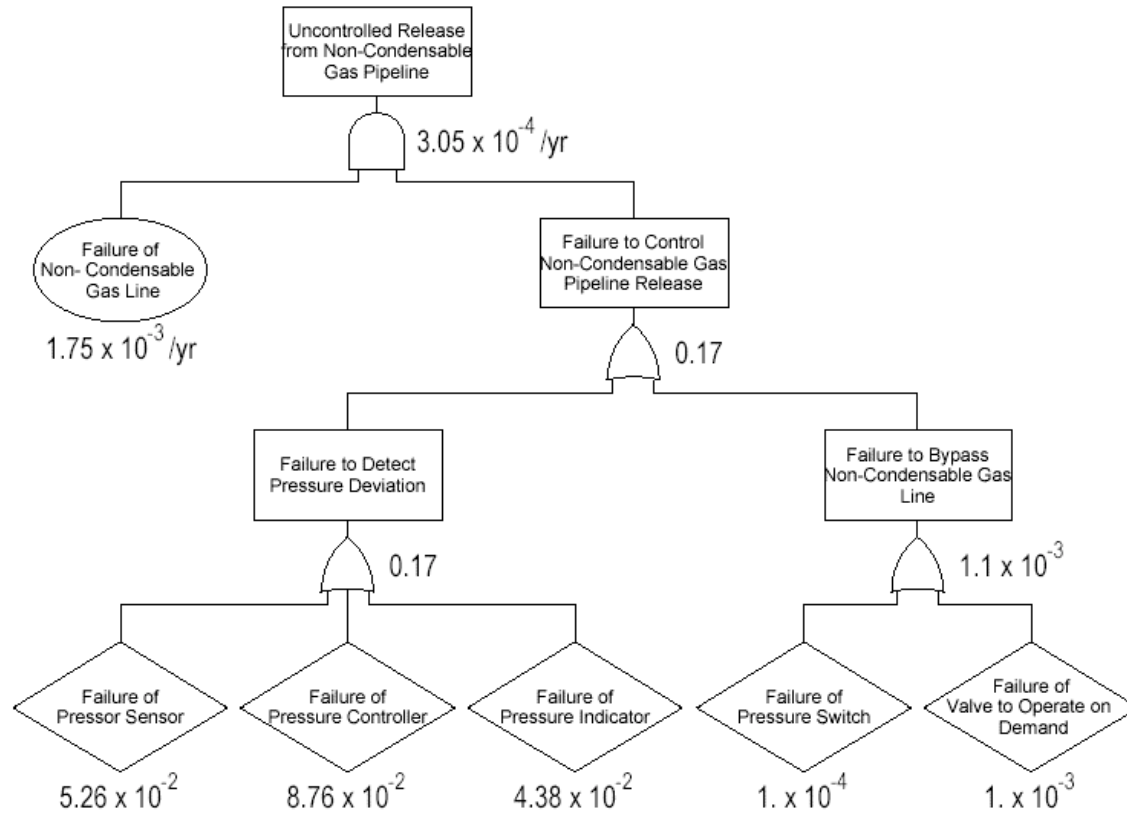
Response to CEC Data Request 51 contained an analysis of one potential upset condition. This particular release scenario does not represent a potential worst-case release as it relies on active mitigation (pressure detection and a bypass valve) to minimize the duration of the release to less than one minute. As shown in Figure 1, there is a relatively high probability that the active safety system would fail on demand.

The Environmental Protection Agency (EPA) under the Risk Management Program (RMP) allows only passive mitigation measures (e.g., dikes, physical vapor barriers, etc.) to be considered, while active mitigation measures (i.e., those systems that rely on automatic detection and control) are assumed to fail. As shown in Figure 1, the automatic bypass system would have approximately a 17 percent chance of failing on demand, just based on the failure rates for the main system components. The actual failure probability could be higher as more components are considered in the fault tree analysis.







- a. Please provide a complete set of Piping and Instrumentation Diagrams (P&IDs), Process Flow Diagrams (PFDs) and Material Balances for all portions of the facility between the production and injection wells, including but not limited to all piping associated with the following areas identified in AFC Figure 3.1-3:
- Production Wells and Pipelines
 - Brine/Steam Handling
 - Power Generation
 - Heat Rejection System

- b. Please prepare a Hazard and Operability (HAZOP) study for the proposed facility to identify potential release scenarios and facility failure modes. The HAZOP study can be based on preliminary facility design or on as-built drawings for a similar facility.
- c. Please provide an analysis of accidental release scenarios for planned and unplanned geothermal steam venting, as well as an estimate of equipment failure rates for each component that could fail and release geothermal steam prior to or during H₂S removal. The analysis should consider the hazards associated with H₂S and NH₃. Please provide all justification for your analysis, including all data and release rates. Planned and unplanned steam venting rates should be based on industry observed rates and the operational performance of similar units. For equipment failure rates, industry specific component failure rates should be used where available. Otherwise, component failure rates from such sources as the American Institute of Chemical Engineers (AIChE) and Center for Chemical Process Safety (CCPS) could be used, adjusted upward to account for the corrosive environment at this facility. It is suggested that scenario failure probabilities be estimated using Fault Tree Analysis (FTA) or some other similar technique.

Figure 1 Fault Tree of Non-Condensable Gas Pipeline



KEY:

-  Circles or Ovals Represent Initiating Events and Therefore Have Yearly Rates of Occurrence
-  Diamonds Represent Contributing Events and Therefore Have Rates of Occurrence per Demand, i.e. Conditional on the Prior Initiating and Contributing Events Having Taken Place
-  Rectangles Represent States Which are the Product of Several Initiating and/or Contributing Events Through an "AND" or "OR" Gate and May Therefore Have Rates of Occurrence Either Yearly or per Demand. Where Release Rates are Indicated, These Events are Separately Considered in the Risk Analysis
-  "AND" Gate - the Rates of Occurrence on the Incoming Branches are Multiplied
-  "OR" Gate - the Rates of Occurrence on the Incoming Branches are Added
-  Hexagons Represent Numbers of Components and Serve as Multipliers

